the form usually known as *Cervus verticornis* Dawk. The cranial portion of the skull was well preserved; the antlers had a spread of 6 feet, measured in a straight line, and the atlas and axis vertebræ had been found associated with the skull.

The specimen was of interest, not only from its unusually perfect condition, but as throwing further light on the characters and affinities of the species, remains of which had been found in large numbers in the Forest-Bed series, but had usually consisted solely of the basal part of the antlers. The restorations which had been published of the distal portions of the antlers were quite misleading, and were responsible for the statement commonly made that the antlers of this species are short and thick and that the crown ends in two points. The antlers were, on the contrary, comparable in their general proportions with those of the Fallow Deer and Irish Deer, and ended moreover in a broadly palmated crown, the edge of which was gently scalloped instead of being produced into long snags. The arrangement of the tines and of the palmation agreed closely with that in the species just mentioned, thus confirming the view that the Forest-Bed form was closely related to its ancestors.

The question of nomenclature was considered, with the result that *C. verticornis* of the Forest-Bed was probably identical with *C. carnutorum* Laug., and was a synonym of *C. belgrandi*, Lart.

This paper will be printed in full in the 'Transactions.'

The following papers were read:—

1. An Account of a Collection of Fishes made by Mr. R. B. N. Walker, C.M.Z.S., on the Gold Coast. By Dr. A. Günther, F.R.S., F.Z.S.

[Received April 22, 1899.]

(Plates XLI.–XLV.)

Mr. R. B. N. Walker, C.M.Z.S., to whom we are indebted almost for the first information on the freshwater fishes of the Gaboon country[1], has brought home a small collection which he formed during a visit to the Gold Coast in the course of last year, and which he has kindly entrusted to me for examination, with instructions to deposit a selection of the specimens in the Natural History Museum.

The collection, small as it is, proved to be of considerable interest, not only because it contained some forms new to this fauna

[1] See Ann. & Mag. N. H. 1867, p. 109.

(*Haplochilus infra-fasciatus*, *Petersius*), but also because it has led to a more critical revision of the Gaboon species of *Chrysichthys*, which are more numerous and more difficult of discrimination than I was formerly inclined to admit.

The specimens were collected at the following localities:—

1. On the River Prah, which falls into the sea at Chama, lat. 5°, long. 2° 30′; a tortuous river with numerous small rapids separated by sluggish pools, its course being chiefly in the Denkera country.

2. On the River Offim, one of the most considerable affluents of the Prah, and very similar to it; its course is through the Ashantee country.

3. On the River Kotchwah, a tributary of the Emissa, which also falls into the sea a little east of Saltpond.

4. On the Sweet River or Kakum, a small river falling into the sea between Elmina and Cape Coast Castle.

Ordinary maps give only an indistinct indication of these rivers, and Miss Kingsley informs me that their topography is all the more perplexing, as most of the rivers have two names, one in the Ya, and the other in the Fantee language.

Chromis ogowensis.

Chromis ogowensis, Günth. Ann. & Mag. N. H. 1896, April, p. 271.

I refer two specimens from the Prah River, two from the Kotchwah R., and three from the Kakum R. to this species. They show only some insignificant differences in the general form of the head. All possess 8 anal rays. The formula of the dorsal fin is $\frac{15}{11}$ in five specimens, and $\frac{15}{12}$ and $\frac{14}{12}$ in two, both these latter specimens coming from the Kakum R. In all the teeth are numerous, viz., from 25 to 29 on each side of the upper jaw. Number of gill-rakers on the outer branchial arch from 13 to 17.

Hemichromis tersquamatus, sp. n. (Plate XLII. fig. B.)

D. $\frac{15}{11}$. A. $\frac{3}{7}$. L. lat. 28. L. transv. 3/10.

Teeth in a double series, those of the inner being minute and rudimentary. The height of the body is contained $2\frac{1}{2}$ times in the total length (without caudal), the length of the head $2\frac{2}{5}$ times. Snout with the upper profile straight. Eye a little nearer to the end of the operculum than to that of the snout, and contained $1\frac{2}{3}$ times in the length of the latter. Interorbital space barely wider than the orbit. Maxillary not reaching to the vertica from the orbit. Cheek with three series of scales. Gill-rakers short and transverse, 11 on the lower branch of the outer arch. Posterior dorsal spines very little longer than the middle ones, the last being two-fifths of the length of the head. Pectoral about as long as ventral, which reaches to the vent. Caudal rounded. Caudal peduncle a little deeper than long. Scales smooth. Body with traces of five broadish dark cross-bands, which are darkest in the middle of the body, where they have the

appearance of large spots; the foremost of these spots is the one on the operculum. A series of black spots along the base of the dorsal fin, each spot covering the base of a spine; another less complete submarginal series.

One specimen, 130 millim. long, from the Kotchwah River.

This species is closely allied to the one which I have identified (with doubt) with *Hemichromis schwebischi*, Sauvage (Ann. & Mag. N.H. 1896, xvii. p. 273), and which Mr. Boulenger—after comparison with the type of the latter—declares to be distinct, describing and figuring it under the name *Chromidotilapia kingsleyæ*, P. Z. S. 1898, p. 151, pl. xix. fig. 2. Some of the front teeth of the Kotchwah specimen are bent inwards, though not quite so conspicuously as in the larger of the specimens of *Chromidotilapia* (96. 5. 5. 38); but I cannot attach any value to this supposed generic character, as a younger specimen of *Chromidotilapia kingsleyæ* (119 millim. long; 96. 5. 5. 36) has the teeth much less strongly bent than the older one.

Chrysichthys.

Chrysichthys, *Octonematichthys*, *Melanodactylus*, Bleeker (1858). *Chrysichthys* Günther (1864).

Mr. Walker's collection contained a number of specimens of this genus, which evidently belonged to several species. In order to name them, and to compare them with others from previous collections with the determination of which I did not feel satisfied, I have been led to revise the whole of the material which I had brought together for the British Museum collection. The following notes on the several species are the results of this examination.

I paid special attention to the disposition of the teeth on the palate, and I convinced myself that I was right (Cat. Fish. v. p. 70) in declining to use modifications, which in some of the species are subject to individual variation, for the establishment of genera, as has been done by Bleeker. I have also questioned the propriety of separating *Clarotes* from *Chrysichthys*, stating my reasons (pp. 71, 73), which, however, weighed so little with that ichthyologist that he placed these genera in the 'Atlas Ichthyologique' into two distinct groups, separated by forms like *Doras*, *Synodontis*, &c.

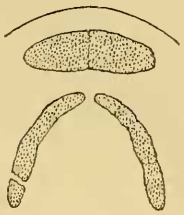
Chrysichthys auratus (Geoffr.).

Chrysichthys auratus Günth. Cat. Fish. v. p. 71.

I refer, for the present, to this species a young specimen, 150 millim. long, from the River Prah, as well as several still younger ones from the River Offim. The eye of these young specimens is, of course, larger than in an adult example from the Nile, the only one I have for comparison. Also the skin on the upper surface of the head is much less thick, which, again, may be accounted for by the difference in age. On the other hand, there are many

important points of agreement, such as the stout habit of the body, the very broad, short, depressed snout, the very wide mouth, the long band of teeth on the palate, which extends on to the palatine

Fig. 1.



Chrysichthys auratus.

bones, and the long adipose fin. A point of little significance is the comparative length of the pectoral spine, which in the Prah specimen is as long as the dorsal spine.

Chrysichthys macrops Gthr.

Some specimens from West African localities which I formerly referred to this species I am now, with more materials before me, able to distinguish as distinct, so that, so far as I know, this species seems to be restricted to the Nilotic system. There are seven specimens in the collection of the Natural History Museum: one obtained by Rüppell on the Lower Nile, and the six others collected by Petherick at Khartoum; one of the latter is made into a skeleton. These specimens vary in length from 155 to 210 millim., and are most instructive, showing a remarkable variation in the

Fig. 2.

Chrysichthys macrops.

backward extent of the teeth of the palate, while all have the first dorsal ray and upper caudal lobe prolonged into a filament.

In none of the specimens is the dentition of the palate perfectly symmetrical, the vomerine band on one side being sometimes longer than on the other, or rudimentary palatine teeth being visible on one side, which are entirely absent on the other. Palatine teeth

may be present or absent, and their development is not dependent on the size of the fish. Thus, in a specimen of 155 millim.[1] the teeth are limited to the vomer, forming two narrow, tapering, oblique patches, without a trace of palatine teeth. In three others (of 162, 190, and 210 millim., Rüpp.) the patches on the vomer are much the same shape, or more band-like, but on the right palatine rudimentary teeth may be seen. In the specimen of 210 millim. the vomerine bands are longer, and behind the end of the band on the left side there is a very small separate patch of palatine teeth. In one specimen of 185 millim. there are distinct palatine teeth, continuous with the vomerine band. Finally in the last (185 millim. skel.) the palatine teeth are likewise present, though not symmetrically developed.

Chrysichthys walkeri, sp. n.

The height of the body is contained four times in the total length (without caudal), the length of the head $3\frac{2}{5}$ times; caudal peduncle rather longer than deep. Head broader than high, its greatest depth being contained $1\frac{2}{3}$ times in its length. The greater portion of its upper surface (with the exception of the snout) is finely granulated, or covered with only a thin film of skin; occipital process longer than the basal bone of the dorsal spine, both meeting a little behind the middle of the nape. Snout short, one third of the length of the head, rather broad, depressed, with the upper profile descending in a gentle curve. Mouth wide, much wider than the distance between the eyes. Nasal barbels thin, as long as or longer than the eye; maxillary and outer mandibulary barbels reaching beyond the gill-opening, if stretched backward. Inner mandibulary barbels slightly anterior to the outer, and half a diameter of the eye distant from each other. The teeth on the palate are confined to the vomer, and form a narrow crescentic band, slightly interrupted in the middle in front. The band of

Fig. 3.

Chrysichthys walkeri.

intermaxillary teeth is somewhat narrowed on the sides, each half being twice as broad as long. The width of the bony interorbital space is $\frac{2}{3}$ of the diameter of the eye, which is contained $1\frac{1}{3}$ times in the length of the snout and $3\frac{2}{3}$ times in that of the head. Dorsal fin not elevated; the length of its base is two thirds of its distance from the adipose fin, the base of which equals, or is but little shorter than, that of the dorsal. Dorsal spine as long as the

[1] Not including the caudal filament in these measurements.

head without snout or as the spine of the pectoral, very slightly serrated along its posterior, and nearly smooth along its anterior edge. Anal fin not reaching the caudal, when laid backward, with 11 or 12 rays, 7 or 8 of which are branched. Caudal fin deeply cleft, with the upper lobe as long as the head. Upper parts greyish brown, lower silvery.

Three specimens from the River Prah, 91 and 139 millim. long.

This species represents in the Gaboon rivers the Nilotic *Chrysichthys macrops*, to which it is closely allied. In that species, however, the anterior dorsal ray is greatly prolonged, even in specimens which exceed the Prah fishes only slightly in length.

CHRYSICHTHYS BÜTTIKOFERI Steind. (Plates XLI. & XLII. fig. A.)

Chrysichthys büttikoferi Steindachner, Notes Leyden Mus. xvi. p. 60 (1894).

The examination of a small number of (chiefly young) specimens of *Chrysichthys* from various localities in the Gaboon country has been attended with much difficulty and uncertainty. A *part* of them seemed to be identical with, or closely allied to, *Ch. büttikoferi* (Steindachner). Although they show certain slight differences in the number of anal rays, extent of the tooth-patches on the palate, form and comparative length of the snout, size of the eye, and length of the dorsal and caudal rays, Steindachner's description applied more or less perfectly to all. However, the series of specimens of any species from the same locality is still so incomplete that we are much in the dark as to individual variations, the changes these fishes undergo with age, or as to any secondary sexual characters. Some years ago I should not have hesitated to refer all these specimens to the same species *Ch. büttikoferi*, and I am not by any means certain that this will not prove to be the proper course to pursue, when sufficient materials are brought together; but since more recent investigations of the West African Fauna have shown the wide distribution and great specific development of this genus, I am induced, after long hesitation, to distinguish among the forms allied to *Ch. büttikoferi* several under distinct names.

The question, then, arises for which of the forms, distinguished here, the name given by Steindachner should be retained. Steindachner's type came from Liberia, is a unicum, and young, being $20\frac{1}{2}$ centim. long. I am indebted to Dr. Jentink for a sketch of this type as well as of its dentition. Unfortunately the specimen presents those elements of uncertainty which render the study of these fishes so difficult. As will be seen from the accompanying sketch, the two patches of larger vomerine teeth are connected with each other by, and are in fact only a portion of, a larger horseshoe-shaped band of minute rudimentary vomerine teeth, extending backward on the palatine bones. In the River Prah specimens referred by me to *Ch. büttikoferi* only the two patches of larger teeth are visible, but none of the rudimentary ones.

Nevertheless, having found that the extent of the dentition in the species of this genus should be used as a taxonomic character with great caution only, and all the more so the younger the specimens are, I cannot make up my mind to employ a distinct name for the Prah specimens.

Fig. 4.

Chrysichthys büttikoferi (type).

I have before me one adult specimen 17 in. long, and four small ones 5 or 6 in. long; they were obtained at the same locality on the River Prah and at the same time, so that there cannot be any doubt that all five belong to the same species. In appearance, and especially in the form of the head, the young differ so much from the old that if they had been obtained at a more distant locality it would have been impossible to recognize their specific affinity.

I therefore give here descriptive diagnoses of both adult and young.

Adult (Pl. XLI.).—The height of the body is contained $4\frac{1}{3}$ times in the total length (without caudal), the length of the head $3\frac{1}{4}$; caudal peduncle two thirds as long as high. Head broader than high, its greatest width being two thirds of its length; the greater portion of its upper surface is covered with thin, soft skin, but the granulated parts of the bones on the nape and crown of the head are exposed or covered only with a thin film of skin; occipital process rather longer than the basal bone of the dorsal spine, both meeting a little behind the nape. Snout rather long, narrowed towards the end, depressed, its length being two fifths of that of the head; upper jaw projecting beyond the lower; mouth of moderate width, as wide as the distance between the eyes. Nasal barbels thin, about as long as the eye; maxillary barbels reaching beyond the orbit, outer mandibulary barbels to the gill-opening; mandibulary barbels inserted in nearly the same straight line, the inner being slightly anterior and less than a diameter of the eye distant from each other. The teeth on the palate are confined to the vomer, being placed in two ovate groups, which are less than half a diameter of the eye distant from each other. The band of intermaxillary teeth tapers outward, each half being twice as broad as long. The width of the bony interorbital space is more than that of the orbit, which is two fifths of the length of the snout, and one sixth of that of the head. Dorsal fin (mutilated) of moderate height; the length of its base is two fifths of its distance from the adipose fin, and not quite twice as long as the base of the latter

Anal fin reaching the caudal, if laid backward, with 13 rays, 8 of which are branched. Caudal fin deeply cleft, with the upper lobe at least as long as the head. Pectoral spine (broken) serrated along both edges. Upper parts greyish olive, sides and abdomen silvery.

Seventeen inches long (433 millim.).

Young (Pl. XLII., fig. A.)—The height of the body is contained $4\frac{2}{3}$ times in the total length (without caudal), the length of the head $3\frac{1}{3}$; caudal peduncle three fifths as high as long. Head as high as broad, its greatest width being equal to the length of the head without snout. Granulations on the upper side of the head and form of the nuchal bones as in the adult. Snout of moderate extent, with the upper profile rather curved; its length is one third, or a little more than one third, of that of the head; upper jaw more or less projecting beyond the lower; mouth of moderate width, wider than the distance between the eyes. Nasal barbels thin, half as long as the eye; maxillary and outer mandibulary barbels reaching to, or even beyond, the gill-opening, if laid backward; inner mandibulary barbels distinctly anterior to the outer, and distant from each other about half a diameter of the eye. The teeth on the palate and intermaxillary are placed as in the adult. The width of the bony interorbital space is scarcely more than half that of the orbit, which is rather less than the length of the snout, and contained $3\frac{1}{4}$ times in that of the head. Dorsal fin rather high, reaching to, or nearly reaching to, the adipose, when laid backward; the length of its base is one half, or a little more than one half, of its distance from the adipose, and exceeds the length of the base of the latter. Dorsal spine serrated along both its edges in its upper portion, and rather shorter than the head. Anal fin reaching or nearly reaching the caudal, if laid backward, with 14 rays, 8 of which are branched. Caudal fin very deeply cleft, both lobes longer than the head. Pectoral spine stronger, but rather shorter than that of the dorsal fin. Upper parts greyish olive; sides and abdomen silvery.

Five and six inches long (130 and 155 millim.).

Chrysichthys ogowensis, sp. n.

Chrysichthys büttikoferi, part., Günth. Ann. & Mag. N. H. 1896, April, p. 276.

The height of the body is contained $4\frac{1}{2}$ times in the total length (without caudal), the length of the head $3\frac{1}{2}$ times; caudal peduncle two thirds as high as long. Head a little broader than high, its greatest depth being two thirds of its length; the greater portion of its upper surface is covered with thin soft skin, but the granulated parts of the bones on the nape and crown of the head are exposed or covered with a thin film of skin; occipital process longer than the basal bone of the dorsal spine, both meeting a little behind the middle of the nape. Snout rather long, depressed, with the upper profile straight, obliquely descending; its length is

contained $2\frac{3}{5}$ times in that of the head; upper jaw projecting beyond the lower; mouth rather wide, a little wider than the distance between the eyes. Nasal barbels half as long as the eye; maxillary and outer mandibulary barbels not reaching the gill-opening, if stretched backward; mandibulary barbels inserted in a nearly straight line, the inner being slightly anterior and half a diameter of the eye distant from each other. The teeth on the

Fig. 5.

Chrysichthys ogowensis.

palate form a rather broad crescent, interrupted in the middle in front, the toothless space being one third as wide as the eye; the teeth may or may not be confined to the vomer[1]. The band of intermaxillary teeth tapers outward, each half being twice as broad as long. The width of the interorbital space is three fourths of that of the orbit, which is contained $1\frac{2}{3}$ in the length of the snout and $4\frac{1}{2}$ times in that of the head. Dorsal fin of moderate height, not extending to the adipose, if laid backward; (dorsal and pectoral spines broken). The length of the base of the dorsal fin is a little less than one half of its distance from the adipose, and about twice as long as the base of the latter. Anal fin not reaching the caudal when laid backward, with 14 rays, 9 of which are branched. Caudal fin deeply cleft, with the upper lobe rather longer than the head. Upper parts olive-coloured, sides and abdomen silvery.

Kondo-Kondo, on the Ogowe River (one specimen 194 millim. long).

The principal character by which this species differs from *Ch. büttikoferi* (s. str.) is the greater development of the teeth on the palate.

Chrysichthys coriscanus, sp. n.

Chrysichthys büttikoferi, part., Günth. Ann. & Mag. N. H. 1896, April, p. 276.

The height of the body is contained $4\frac{1}{2}$ times in the total length (without caudal), the length of the head $3\frac{1}{3}$ times; caudal peduncle two thirds as high as long. Head scarcely broader than high, its

[1] They are confined to the vomer on the right side, but on the left they are continued on the palatine as a short patch, slightly separated from the vomerine band.

greatest width being two thirds of its length. The greater portion of the upper surface of the head is granulated, or covered only with a thin film of skin; the snout, as usual, is covered with soft skin. Occipital process longer than the basal bone of the dorsal spine, both meeting behind the middle of the nape. Snout of moderate length, narrowed towards the end, with the upper profile descending in a curved line; its length is one third of that of the head. Upper jaw slightly overlapping the lower; mouth of moderate width, as wide as the distance between the eyes. Nasal barbels minute, about one-third the width of the eye; maxillary barbels reaching the gill-opening, outer mandibulary barbels not reaching the gill-opening, if stretched backward; mandibulary barbels inserted in a straight line, the inner being one third of the diameter of the eye distant from each other. The teeth on the palate are confined to the vomer, being placed in two small groups which are distant from each other about one fourth of the diameter of the eye[1]. The band of intermaxillary teeth is scarcely tapering outward, each half being two thirds as long as broad. The width of the bony interorbital space is three fifths of the diameter of the eye, which is four fifths of the length of the snout, and contained $3\frac{1}{3}$ times in that of the head. Dorsal fin rather high, but not reaching the adipose fin, if laid backward; the length of its base is one half, or a little less than one half, of its distance from the adipose fin, and nearly twice as long as the base of the latter. Dorsal spine as long as the head without snout, with indistinct posterior serrature in its upper half. Anal fin not reaching the caudal, if laid backward, with 12 rays, 7 of which are branched. Caudal fin deeply cleft, with the upper lobe rather longer than the head. Pectoral spine as long as that of the dorsal fin, smooth along the outer edge. Upper parts greyish olive, sides and abdomen silvery.

Corisco Isld. (two specimens, 148 and 163 millim. long).

The principal character by which this species differs from *Ch. büttikoferi* (s. str.) is the smaller number of anal rays.

Chrysichthys lagoensis, sp. n.

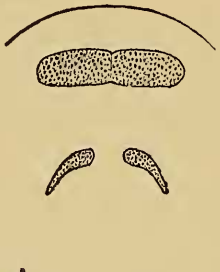
Chrysichthys macrops, part., Günth. Ann. & Mag. N. H. 1867, Aug. p. 111.

The height of the body is two ninths of the total length (without caudal), the length of the head rather less than one third. Caudal peduncle two thirds as high as long. Head a little broader than high, its greatest depth being two thirds of its length; the greater portion of its upper surface is granulated. Occipital process rather broad, as long as the basal bone of the dorsal spine, both meeting in the middle of the nape. Snout long, two fifths of the

[1] The two specimens are not quite alike in this respect; on the right-hand side of the larger specimen, the patch of teeth is continued backward in a single series of about six minute teeth. In the smaller specimens the two vomerine patches are rather more approximated than in the larger.

length of the head, broad, with the upper profile descending in a gentle curve. Mouth wide, wider than the distance between the eyes, with the upper jaw overlapping the lower. Nasal barbels minute; maxillary barbels extending to the margin of the præoperculum; outer mandibulary barbels not reaching the gill-opening; inner mandibulary barbels anterior to the outer, and less than half a diameter of the eye distant from each other. The vomerine

Fig. 6.



Chrysichthys lagoensis.

teeth are disposed in a narrow band on each side, tapering behind, the two bands being separated in front by a toothless space, less than half a diameter in width; however, on the right side there are vestiges of another narrow tooth-band, stretching across the junction of the vomer with the palatine.[1] Each half of the intermaxillary band rounded at its lateral extremity, half as long as broad. The width of the bony interorbital space is more than the diameter of the eye, which is two fifths of the length of the snout and one fifth of that of the head. Dorsal fin elevated and enlarged, reaching the adipose when laid backward; the length of its base is one half of its distance from the adipose fin, and double the length of the base of the latter. Dorsal spine rather longer than the head without snout, and longer than the pectoral spine; it is slightly roughened in front, and feebly denticulated behind. Anal fin reaching the caudal, when laid backward, with 11 rays, 7 of which are branched, the last split to the base. Cleft of the caudal of moderate depth, the upper lobe as long as the head. Upper and lateral parts brownish, lower white.

Lagos (Nat. Hist. Mus. 66.3.8.16). Length 377 millim.

A form intermediate between *Ch. nigrodigitatus* and *Ch. macrops*.

A number of very young specimens, collected by Mr. Walker on the River Offim, belong to a species most closely allied to *Ch. lagoensis*, but it would be hazardous to refer them to that species

[1] Of course, this condition cannot be regarded as a specific character, but I describe it as I find it in the only specimen available.

without knowing more of the changes that must take place during growth.

Chrysichthys nigrodigitatus Lacép.

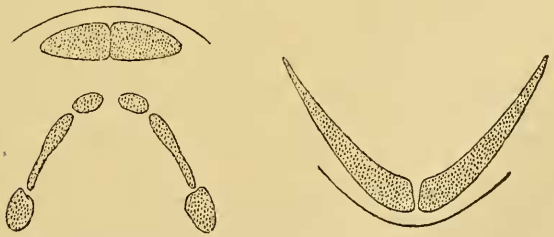
Of this species two specimens are in the Natural History Museum; it is not known from what West African river they were obtained. One measures 280 millim., the other 130 millim. in length, excluding the caudal fin. In spite of the great difference in size, both agree in form of the snout, in the great development of the dorsal fin, prolongation of caudal lobes, number of anal rays (nine branched), &c. Only the eye is very much larger in the younger specimen, as might be expected. In both, the teeth of the palate are confined to the vomer, and appear in the young as two small, oblique, ovate patches; in the older specimen the two patches are produced behind into a narrow tract of teeth.

Chrysichthys persimilis, sp. n. (Plate XLIII.)

Chrysichthys macrops, part., Günth. Ann. & Mag. N. H. 1867, xx. p. 111.

The height of the body is one fifth of the total length (without caudal), the length of the head a little less than one third. Caudal peduncle two thirds as high as long. Head a little broader than high, its greatest depth being contained $1\frac{3}{4}$ times in its length. The greater portion of its upper surface is granulated, but covered with a thin film of skin; occipital process longer than the basal bone of the dorsal spine, both meeting a little behind the middle of the nape. Snout long, three eighths of the length of the head, broad, rather depressed. Mouth of *great width*, extending to

Fig. 7.



Chrysichthys persimilis. Upper and lower teeth

below the middle of the distance between eye and nostril, much wider than the distance between the eyes. Nasal barbels small and short, about half as long as the eye. Maxillary barbels reaching to, outer mandibulary barbels not reaching to, the gill-opening when stretched backward. Inner mandibulary barbels anterior to the outer, half a diameter of the eye distant from each other. The teeth on the palate occupy vomer and palatine bones, and

are disposed in three divisions (more or less continuous) on each side; the anterior division is a small rounded patch, the middle a narrow band stretching from vomer to palatine, the posterior on the palatine a rather broad ovate patch. The band of intermaxillary teeth tapers outward, and each half is half as long as broad; *the length of the mandibulary band of teeth is contained* $2\frac{2}{3}$ *times in that of the head.* The width of the bony interorbital space equals the diameter of the eye, which is contained $1\frac{3}{4}$ times in the length of the snout and $4\frac{2}{3}$ times in that of the head. Dorsal fin not elevated; the length of its base is one half of its distance from the adipose fin, the base of which is rather less than that of the dorsal. Dorsal spine shorter than the head without snout, equal in length to the pectoral spine, smooth in front, serrated behind. Anal fin not reaching the caudal, when laid backward, with 12 rays, 8 of which are branched. Caudal fin deeply cleft, with the upper lobe a little longer than the head. Upper and lateral parts blackish-brown.

Gaboon, collected by R. B. N. Walker, Esq. One specimen, 290 millim. long.

This species is extremely similar to the type of *Ch. furcatus*, with which it agrees singularly well in regard to the disposition of the teeth on the palate, and the form and formation of the snout and mouth; but its body is considerably stouter and shorter, the dorsal fin is less elevated, the adipose longer. The differences may be epitomized thus:

Ch. furcatus.	*Ch. persimilis.*
Height of body one sixth;	one fifth.
Length of the head about one fourth;	about one third.
Base of dorsal fin = two fifths of distance between dorsal fins;	one half.
Dorsal spine less than length of head without snout;	equal to that length.
Base of adipose fin much shorter than that of dorsal;	rather shorter.
Intermaxillary band of teeth rounded at each end;	tapering.

CHRYSICHTHYS KINGSLEYÆ, sp. n. (Plate XLV. fig. A.)

The height of the body is two ninths of the total length (without caudal), the length of the head a little less than one third. The depth of the caudal peduncle is contained $1\frac{2}{3}$ times in its length. Head a little broader than high, its greatest depth being contained $1\frac{3}{5}$ times in its length; its upper parts are covered with skin; occipital process rather longer than the basal bone of the dorsal spine. Snout rather long, somewhat contracted in front, with the upper profile descending in a gentle curve; its length is contained $2\frac{2}{3}$ times in that of the head. Mouth rather wide, not extending to the middle of the distance between eye and nostril, wider than the distance between the eyes. Nasal barbels small

and short, about half as long as the eye. Maxillary barbels reaching to, outer mandibulary barbels not reaching to, the gill-opening when laid backward. Inner mandibulary barbels inserted in a nearly straight line with the outer ones, their roots being about half a diameter of the eye distant from each other. The teeth on the palate occupy vomer and palatine bones and are

Fig. 8.

Chrysichthys kingsleyæ. Upper and lower teeth.

disposed in two elongated patches on each side. The band of intermaxillary teeth is obliquely truncated at its lateral extremity, and two thirds as long as broad; *the length of the mandibulary band of teeth is one fourth of that of the head.* The width of the bony interorbital space is three fourths of the diameter of the eye, which is one fourth of the length of the head. Dorsal fin not elevated; the length of its base is one half of its distance from the adipose fin, the base of which is less than that of the dorsal. Dorsal spine shorter than the head without snout, equal in length to the pectoral spine, smooth in front, serrated behind. Anal fin just reaching the caudal, when laid backward, with 12 rays, 8 of which are branched. Caudal fin deeply cleft, with the upper lobe equal in length to the head. Upper parts dark with bluish tinge, sides and abdomen silvery.

River Ogowe; 225 millim. long.

This species is very closely allied to *Ch. persimilis*, and I have long hesitated before distinguishing it. In fact, it formed part of Miss Kingsley's collection, which I described in 1896; but, unwilling at that time to establish a species on apparently insufficient ground, I put it aside for future consideration. The principal difference from *Ch. persimilis* is that the cleft of the mouth does not extend equally far backward, and that the mandibulary band of teeth is very much shorter, indicating a proportionally shorter mandible. Unfortunately, we do not know from which of the Gaboon rivers *Ch. persimilis* was obtained.

CHRYSICHTHYS CAMARONENSIS, sp. n. (Plate XLIV.)

The height of the body is contained $4\frac{2}{3}$ times in the total length (without caudal), the length of the head $3\frac{1}{4}$ times. Caudal peduncle two thirds as high as long. Head broader than high, its greatest depth being contained $1\frac{2}{3}$ times in its length. The granu-

lations on its upper surface are covered by a thin skin. Occipital process about as long as the basal bone of the dorsal spine, both meeting in the middle of the nape. Snout very long, contained $2\frac{1}{3}$ times in the length of the head, broad, depressed, with the upper profile straight, and with the upper jaw much projecting beyond the lower. Mouth of moderate width, rather less than the distance between the eyes. Nasal barbels nearly as long as the eye; maxillary barbels extending to the margin of the præoperculum, outer mandibulary not reaching the gill-opening. Inner mandibulary barbels nearly in a straight line with the outer, and two thirds of the diameter of the eye distant from each other. The vomerine teeth are disposed on each side in two rather broad continuous patches, the halves being separated in front by a toothless space; the palatine bones are armed with a narrower band-like patch. Intermaxillary band narrowed outward, each half not quite twice as broad as long. The width of the bony interorbital space exceeds that of the orbit, which is contained $2\frac{2}{3}$ times in the length of the snout, and is one sixth of that of the head. Dorsal fin not elevated; its base is two fifths of its distance from the adipose, and double the length of the base of the latter fin. Dorsal spine as long as the head without snout, rather longer than the pectoral spine, smooth in front, and feebly denticulated behind. Anal fin reaching the caudal, when laid backward, with 15 rays, 10 of which are branched, the last split to the base, the first quite rudimentary. Caudal deeply cleft, the upper lobe a little longer than the head. Upper and lateral parts brownish, lower white.

Camaroons (Nat. Hist. Mus. 71.11.20.21). Length 600 millim.

Intermediate between *Ch. cranchii* and *Ch. nigrodigitatus*.

Eutropius congensis (Leach).

Two specimens from the Prah River. The anal fin of one with 56, of the other with 59 rays. Feeds largely on macrurous crustaceans.

Barbus trispilus (Bleek.).

Puntius (*Barbodes*) *trispilus*, Bleek. Mém. Soc. Holl. Haarlem, 1862, p. 113, tab. 23. fig. 3.

Two specimens from the Kotchwah River, 27 and 76 millim. long.

Relying on Bleeker's description alone, I should have been hardly justified in referring our specimens to his species. He describes it as a large-eyed species, with the eye longer than the snout, the diameter being one third, or a little less than one third, of the length of the head, and equal to, or a little less than, the length of the postorbital portion. His specimens measured from 72 to 110 millim.; thus his smaller specimen was almost the same size as our larger one. Nevertheless, I find the eye to be conspicuously smaller, viz., two sevenths of the length of the head and two thirds of that of the postorbital portion. Even our very

young specimen agrees better with these proportions than with those given by Bleeker. On the other hand, in the figure by which he illustrates his description, the eye seems to have been represented of too small a size.

HAPLOCHILUS INFRAFASCIATUS Gthr.

Several immature specimens from the Kakum River.

ALESTES LONGIPINNIS Gthr.

Is apparently common in the Kotchwah River.

PETERSIUS OCCIDENTALIS, sp. n. (Plate XLV., fig. B.)

D. 10. A. 21–24. L. lat. 25. L. transv. 4/3.

The height of the body is contained 3 times, the length of the head $3\frac{2}{3}$ times in the total (without caudal); eye large, longer than the snout, and contained $2\frac{2}{3}$ times in the length of the head; head, like body, strongly compressed, but the abdomen rounded in front of the ventrals. Dorsal fin higher than long, its first ray in the middle between the end of the snout and the root of the caudal. Anal of the mature male with the anterior rays somewhat enlarged, forming a projecting lobe. Caudal forked. There are two series of scales between the lateral line and ventral fin; the lateral line is anteriorly curved downward and runs towards the lower edge of the caudal peduncle, the perforations of the scales becoming indistinct. Silvery, with an indistinct, narrow, bluish band along the middle of the side and tail. Dorsal fin black in its anterior half, with a yellow band across the middle. This ornamental marking is most distinct in adult males, and very obsolete in immature specimens.

Six specimens, the longest 60 millim. long, from the Kotchwah River.

I have referred this fish to Hilgendorf's genus *Petersius* (S.B. Ges. ntrf. Fr. Berlin, 1894, p. 172), from the Kingani River in East Africa, although it does not quite agree with Hilgendorf's description of the dentition; this author also does not mention the partial disappearance of the lateral line on the tail. The teeth in the intermaxillary stand in two series, but the two series are quite separate, and the teeth of the two series are opposite to each other rather than alternate. I count six in the anterior, eight in the posterior, and as many in the mandibular series. The largest are in the posterior series, where they may be seven-pointed, the largest central cusps being laterally compressed. Those of the front series are more simple, but all seem to be tricuspid at least. No maxillary teeth.

MORMYRUS LONGICEPS Gthr.

Mormyrus longiceps, Günth. Ann. & Mag. N. H. 1867, xx. p. 116.

One specimen, from the Kotchwah River.

EXPLANATION OF THE PLATES.

Plate XLI.

Chrysichthys büttikoferi, adult, p. 721, 4/9 nat. size. Dentition nat. size.

Plate XLII.

A. *Chrysichthys büttikoferi*, juv., p. 723.
B. *Hemichromis tersquamatus*, p. 717.

Plate XLIII.

Chrysichthys persimilis, p. 727, 5/7 nat. size.

Plate XLIV.

Chrysichthys camaronensis, p. 729, 1/3 nat. size. Dentition nat. size.

Plate XLV.

A. *Chrysichthys kingsleyæ*, p. 728, 6/7 nat. size.
B. *Petersius occidentalis*, p. 731, with enlarged views of anal fin of male and female, and of dentition.

2. On a few Points in the Structure of Laborde's Shark (*Euprotomicrus labordii*). By Robert O. Cunningham, M.D., C.M.Z.S., Professor of Natural History, Queen's College, Belfast.

[Received April 28, 1899.]

An individual of this curious and little-known Elasmobranch having recently reached my hands, I have drawn up a few notes on its anatomy, which, though very imperfect and fragmentary, I venture to submit to the Zoological Society of London.

The specimen, which is a female, was, I am informed, one of several obtained by Captain F. R. Patey, of the ship 'Mowwan,' having been washed on board his vessel between 90° & 100° W. long. and in about the latitude of Cape Horn, and was presented to our Museum in Queen's College through the intervention of Mr. Adam T. Barklay of Belfast. As examples previously met have been recorded as inhabiting the Indian Ocean, the range of the species must be considerably more extensive than was formerly supposed—a not surprising circumstance when the wide distribution of many pelagic species of animals is taken into account. Two causes have combined to render the following description much less complete than I could have desired. In the first place, I have not felt warranted to carry out the dissection to such an extent as to render the specimen unavailable for Museum purposes, and, secondly, the condition of the viscera was unfortunately not such as to permit of detailed examination.

In respect of size my example does not materially differ from those